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Thomas Christ

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SAP/BSTZ

BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP

1279 OAKMEAD PARKWAY

SUNNYVALE, CA 94085-4040

EXAMINER

TEIXEIRA MOFFAT, JONATHAN CHARLES

ART UNIT

PAPER NUMBER

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/562,378	Applicant(s) CHRIST ET AL.	
	Examiner JONATHAN TEIXEIRA MOFFAT	Art Unit 2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

In view of the appeal brief filed on 6/23/2008, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

/Eliseo Ramos-Feliciano/
Supervisory Patent Examiner, Art Unit 2857

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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1. Claims 24-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Specifically, these claims are indefinite based on the use of the phrase "associated with". Inherently, a resource (such as a vehicle, material, or other transportable entity) has attributes inherent to it. It would seem then that these attributes are "associated with" the resource. With respect to nodes, since each node is used to label a physical location, it would seem too that these inherently have attributes. The same logic applies to attributes of routes.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2.

Claims 1-2, 4-6, 9-23 and 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poppen (US pat 5916299) in view of Bancroft (US pat pub 20020165638).

With respect to claim 1, Poppen discloses a method comprising:

1) Determining the distance within the source zone between the first location and an exit node of the source zone (Fig 5 item 303).

2) Determining the distance between the exit node of the source zone and an entry node of the destination zone (Fig 5 item 305)

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3) Determining the distance within the destination zone between the entry node of the destination zone and the second location (Fig 5 item 304).

4) Obtaining the path length by summing up the distances determined in the preceding steps (Fig 5 item 306 and column 1 lines 35-40 and 47-49 and column 6 lines 27-41 and column 10 lines 32-34).

5) Wherein a resource may travel the path between the first location and the second location (column 1 lines 47-55).

With respect to claims 2 and 6, Poppen discloses distances within zones (column 1 line 40) which must have been determined or calculated at some point according to a metric given the broadest reasonable interpretation of the term. The examiner is unsure what sort of metric is excluded by the limitation of "Euclidean or Manhattan metric". Euclidean allows for line interconnections in any direction.

With respect to claims 4-5, Poppen discloses locations and nodes defined by coordinates (column 4 lines 11-20).

With respect to claim 9, Poppen discloses that the distances between nodes of two different zones are looked up in a table which comprises pre-calculated distances of each pair of nodes of different zones (Fig 4 and column 11 line 64 - column 12 line 7).

With respect to claim 11, Poppen discloses a route based on properties of at least one of a resource, a route and a node (Figs 4 and 8a-b and column 1 lines 35-48).

With respect to claims 12 and 16, Poppen discloses a path determined which is the shortest path between the first and second locations (Fig 8b item 33 lb).

With respect to claim 13, Poppen discloses a method comprising:

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- 1) Determining a route from the first location to an exit node of the source zone (Fig 5 item 303).
- 2) Determining the distance within the source zone between the first location (Fig 6 point “H” for instance) and the exit node (Fig 6 point “O” for instance) of the source zone (column 1 lines 35-40 and 47-49).
- 3) Determining a route from the exit node (Fig 6 point “O”) of the source zone (Fig 6, leftmost zone) to a second point associated with the source zone (Fig 6 point “G” for example).
- 4) Determining the distance between the exit node of the source zone and the second point associated with the source zone (column 1 lines 35-40 and 47-49).
- 5) Determining a route from the second point (Fig 6 point "G" for instance) associated with the source zone to a third point associated with the destination zone (Fig 6 point “E” for instance).
- 6) Determining the distance between the second point associated with the source zone and the third point associated with the destination zone (column 1 lines 35-40 and 47-49).
- 7) Determining a route from the third point (Fig 6 point “E” for instance) associated with the destination zone to an entry node (Fig 6 point "C" for instance) of the destination zone;
- 8) Determining the distance between the third point associated with the destination zone and the entry node of the destination zone;
- 9) Determining a route between the entry node of the destination zone and the second location (Fig 5 item 304).
- 10) Determining the distance within the destination zone between the entry node of the destination zone and the second location (column 1 lines 35-40 and 47-49).

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11) Obtaining the path length by summing up each of the determined distances (Fig 5 item 306 and column 1 lines 35-40 and 47-49 and column 6 lines 27-41 and column 10 lines 32-34).

12) Wherein a resource may travel the path between the first location and the second location (column 1 lines 47-55).

With respect to claim 14, Poppen discloses that for each route, a resource is determined which is able to move on the route (Fig 6 and column 1; inherently, if for instance roads are chosen to be mapped, this is because a resource such as a vehicle, has been determined to need path finding).

With respect to claim 15, Poppen discloses that only such routes are determined on which selected resources are able to move (Fig 6 and column 1; inherently if the resource is a truck, only roads will even be considered while, for example, bike paths or waterways will not).

With respect to claim 17, Poppen discloses that the one path is determined which satisfies best a cost criterion, the cost criterion taking into account at least one of distances of the routes, travel time for the resource on the routes, and characteristics of the resources (Figs 4 and 8a-b and column 1 lines 35-48).

With respect to claim 18, Poppen discloses that each route determining step is followed by a step of calculating a cost criterion, whereby calculating the cost criterion takes into account at least one of distances of the respective determined route, travel time for the resource on the respective determined route, and an average value of characteristics of all the resources for the respective determined route (Figs 4 and 8a-b and column 1 lines 35-48).

With respect to claim 19, Poppen discloses a method comprising:

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1) Defining a first plurality of zones (Fig 6), whereby with each zone, at least one node is associated (Fig 6 items A-F), the node representing an entry and/or exit point to/from the zone.

2) Defining a first plurality of routes, each route representing a path for movement of a resource between nodes of a pair of zones, whereby with each of the routes, a path length is associated which is representative of the length of the route (Fig 6, each shown connection is with length).

3) Defining a second plurality of routes, each route representing a path for movement of a resource within a zone between nodes of the zone (Fig 6), wherein for each of the routes, a path length is associated which is representative of the length of the route (Fig 6).

4) Wherein a resource may travel the path between the first location and the second location (column 1 lines 47-55).

With respect to claim 21, Poppen discloses defining a plurality of exceptions, each exception representing an obstacle for movement of a resource type on a route, whereby with each obstacle, a path length is associated which is representative of the length of the detour caused for the resource type to move around the obstacle (column 1 lines 50-60; here the paths are selected so as to avoid areas where “pieces of road do or do not connect... turns are restricted and so on” which comprise obstacles).

With respect to claim 22, Poppen discloses a mandatory route representing a forced route (Fig 6 items H and I which have only once choice in going to any other locations. If the "resource" in question here were a truck, this may be due to the fact that only one road connects these while if the “resource” were a bike this limited choice would not exist).

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With respect to claim 23, Poppen discloses defining a further plurality of nodes (if 6 items A and B), each of the nodes representing a predefined location outside the zones (it is in a third separate zone) and defining a third plurality of routes, each of the routes representing a path for movement of a resource between a node of the further plurality of nodes and a another node, whereby with each of the routes, a path length is associated which is representative of the length of the route (Fig 6, lines connecting A and B).

With respect to claims 29-31, Poppen discloses computer-readable storage medium for running such a program (column 1 lines 35-48).

With respect to claim 1, Poppen fails to disclose:

A warehouse environment.

5) Scheduling a resource to travel the path between the first location and the second location in response to a request, the scheduling of the resource based on a comparison of a priority of the request with a priority of a scheduled task.

With respect to claim 10, Poppen fails to disclose determining a path in a warehouse for movement of a resource between a first location, which is in a source zone of the warehouse, and a second location, which is in a destination zone of the warehouse.

With respect to claim 13, Poppen fails to disclose:

A warehouse environment.

3)-8) Pick-up and drop-off points. Specifically, the disclosure of Poppen is open-ended as to how many intermediate points there may be in the route. Thus, a plurality of intermediate points, associated with the source zone, destination zone, or other zones, are disclosed.

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However, as Poppen does not disclose a robot in a warehouse, pick and drop locations are not disclosed specifically.

12) Scheduling a resource to travel the path between the first location and the second location in response to a request, the scheduling of the resource based on a comparison of a priority of the request with a priority of a scheduled task.

With respect to claim 19, Poppen fails to disclose:

1) Zones representing a grouping of bins, or a work center, and whereby with each bin and with each node in a zone, coordinates are associated which are representative of their location in the zone.

3) Movement of a resource within a zone between a bin and a node of the zone.

4) Scheduling a type of resource to travel a route determined from the path between nodes of the pair of zones in response to a request, the scheduling of the type of resource based on a comparison of a priority of the request with a priority of a scheduled task.

With respect to claim 20, Poppen fails to disclose defining a plurality of resource types, each resource type representing a kind of facility used for movement of a good within the warehouse.

Bancroft teaches, with respect to claim 1:

A warehouse environment (paragraph 0031).

5) Scheduling a resource (Fig 7 items 810, 820 and 830) to travel a path between the first location and the second location (Fig 4 item 410) in response to a request, the scheduling of the resource based on a comparison of a priority of the request with a priority of a scheduled task (Fig 15 and paragraph 0168).

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Bancroft teaches, with respect to claim 10 determining a path in a warehouse (paragraph 0031) for movement of a resource between a first location, which is in a source zone of the warehouse, and a second location, which is in a destination zone of the warehouse (paragraph 0088).

Bancroft teaches, with respect to claim 13:

A warehouse environment (paragraph 0031).

3)-8) Pick-up and drop-off points (paragraph 0088). In particular, the final sentence of that paragraph.

12) Scheduling a resource (Fig 7 items 810, 820 and 830 and paragraph 0088) to travel a path between the first location and the second location (Fig 4 item 410) in response to a request, the scheduling of the resource based on a comparison of a priority of the request with a priority of a scheduled task (Fig 15).

Bancroft teaches, with respect to claim 19:

A warehouse environment (paragraph 0031).

1) Zones representing a grouping of bins, or a work center (paragraph 0088), and whereby with each bin and with each node in a zone, coordinates are associated which are representative of their location in the zone (paragraph 0121).

3) Movement of a resource within a zone between a bin and a node of the zone (paragraphs 0088 and 0121).

4) Scheduling a type of resource (Fig 7 items 810, 820 and 830 and paragraph 0088; the type here being whatever resource is needed for the particular task at hand, i.e. food, paper, cash, etc.) to travel a route determined from the path between nodes of the pair of zones (Fig 4 item

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410 and paragraphs 0118-0120) in response to a request, the scheduling of the type of resource based on a comparison of a priority of the request with a priority of a scheduled task (Fig 15).

Bancroft teaches, with respect to claim 20, defining a plurality of resource types (Fig 7 items 810-850)), each resource type representing a kind of facility used for movement of a good within the warehouse (Fig 7 and paragraph 0088).

One of ordinary skill in the art would have found it obvious at the time of applicant's invention to modify the method of Poppen by applying this navigation method to the robotic environment of Bancroft. Poppen discloses (as only one of many possible uses for the described nodal system) path finding on maps using locations corresponding to nodes (column 1 lines 49-53). Bancroft discloses nodes corresponding to locations in a warehouse environment (paragraphs 0118-0120) and further expresses the desire to move efficiently between these locations (paragraph 0168). One of ordinary skill in the art would find it obvious and reasonable to try applying the path finding methodology of Poppen to the navigational needs of the robot of Bancroft with reasonable expectation of success and the assumption that it would allow the robot of Bancroft to efficiently navigate between its location nodes, mirroring the benefits discussed by Poppen.

3.

Claims 3 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poppen and Bancroft as applied to claim 1 above, and further in view of Short (US pat 5187667).

With respect to claims 3 and 7-8, Poppen discloses the distance between two zones (Fig 6).

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With respect to claim 8, Poppen discloses in case there is an obstacle blocking the direct way between the two zones, determining an additional distance for a path around the obstacle (column 1 lines 50-60; here the paths are selected so as to avoid areas where “pieces of road do or do not connect... turns are restricted and so on” which comprise obstacles).

With respect to claim 3, Poppen and Bancroft fail to disclose that the distance between two zones is determined by applying a line-of-sight principle.

With respect to claim 7, Poppen and Bancroft fail to disclose determining the distance of the most direct way between the two zones.

Short teaches, with respect to claim 3, using a line-of-sight principle to determine geographical distances (Fig 2 and column 3 lines 37-63).

Short teaches, with respect to claim 7, determining the distance of the most direct way between the two zones (Fig 1 and column 2 lines 45-65).

It would have been obvious to one of ordinary skill in the art to modify the method of Poppen and Bancroft by utilizing a line-of-sight principle to determine distances as taught by Short. In reviewing the navigation method of Poppen, no mention is given as to how the distances between nodes (and thus between zones) is determined. One of ordinary skill in the art would find it obvious to look to prior inventions as the problem appears to have been solved by the time of Poppen. One of ordinary skill in the art would have found it reasonable to try a number of methods and although “line-of-sight” appears to apply broadly to any sort of linear method (Such as laser range finding or sonar etc), Short is relied upon to show that the concept is documented and obvious.

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Response to Arguments

Applicant's arguments with respect to claims 1, 13 and 19 have been considered but are moot in view of the new ground(s) of rejection.

With respect to applicant's arguments concerning claim 5 (page 19 of the appeal brief), the examiner agrees with applicant's assessment that Poppen discloses longitude and latitude in map. However, the examiner disagrees that the nodes of Poppen are located at unknown coordinates as applicant appears to be asserting. Further, the examiner points out that the language of claim 5 requires that the nodes are "defined by coordinates". Given the broadest reasonable interpretation, this requires that the nodes refer to real locations as all locations, by definition, are "defined by coordinates".

With respect to applicant's arguments concerning claim 12, the examiner disagrees with the applicant's assessment of Poppen. From figure 6, it is clear that a path can be charted from any node to any other node regardless of zone. When, however, the destination and start nodes are in different zones, entry/exit nodes are used to transition out of the zone.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JONATHAN TEIXEIRA MOFFAT whose telephone number is (571)272-2255. The examiner can normally be reached on Mon-Fri, from 7:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/jtm/

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8/11/2008

/Bryan Bui/

Primary Examiner, Art Unit 2863